

CLAIMS

We claim:

1. A method of treating spent alkaline pulping liquor (black liquor), comprising the steps of:

providing black liquor having lignin therein;

acidulating a phosphate containing material, wherein phosphoric acid is generated by treatment of said phosphate containing material, and

mixing said black liquor with phosphoric acid from said acidulated phosphate containing material to cause separation of said lignin from said black liquor, wherein clarified liquor comprising anion species including phosphate is produced.
2. The method of claim 1, wherein said phosphate containing material comprises phosphate comprising rock, said acidulating step comprising contacting said phosphate comprising rock with a sulfuric acid solution, wherein said acidulated phosphate containing material comprises an acidulated phosphate rock slurry.
3. The method of claim 2, wherein an amount of said sulfuric acid solution used in said acidulation step is less than the amount necessary for complete conversion of said phosphate rock to said phosphoric acid.
4. The method of claim 1, wherein said method includes the step of adding a water soluble, surface active, polymeric, coagulant agent to said black liquor.
5. The method of claim 4, wherein said adding step precedes said mixing step.

6. The method of claim 5, wherein a surface active agent coactive with said polymeric, coagulant agent, is added to said black liquor prior to the said mixing step.

7. The method of claim 2, further comprising the step of filtering said acidulated phosphate containing material to form a solid-free liquid phase comprising said phosphoric acid, said filtering step prior to said mixing step.

8. The method of claim 1, further comprising the step of causticizing said clarified liquor using a material comprising calcium oxide.

9. The method of claim 1, wherein said causticizing step precipitates at least one calcium phosphate comprising species.

10. The method of claim 9, wherein said calcium phosphate comprising species include calcium monophosphate.

11. The method of claim 1, wherein said black liquor is obtained from a kraft process pulping plant.

12. The method of claim 1, wherein said black liquor is obtained from a soda process pulping plant.

13. Solid products resulting from the method of claim 1.